

## POLITICIANS, BUSINESSMEN, WARRIORS, AND CIVILIANS: ANALYZING THE COMPLEXITY OF THE IRAQ CONFLICT

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### ABSTRACT

How can contemporary conflicts (e.g., like those experienced in Afghanistan, Chechnya, Colombia, Sierra Leone, or Iraq) be more adequately described? An intuitive WarSocietyModel (iWSM) ontology (which was subsequently case-study-validated) is suggested as a starting point. The implementation of iWSM into an agent-based model — WSM — should lead to a better understanding of contemporary conflicts in general and the Iraq conflict in particular. We find that political heterogeneity in a contemporary conflict setting may be more prone to violence than is a less fragmented political landscape. Our results also suggest that neither greed nor violence contributes independently from the other to a contemporary conflict's outcome. Our data appear to be congruent with the common notion that the civilian population bears the brunt of contemporary conflicts. From a methodological perspective, our research suggests a qualitative but, at the same time, formalized procedure.

**Keywords:** Agent-based modeling, complex systems, social simulation, contemporary conflict, Iraq

### INTRODUCTION

The armed hostilities in Afghanistan, Chechnya, Colombia, Sierra Leone, and Iraq have epitomized the nature of contemporary conflicts. While some scholars relate contemporary conflicts to concepts such as new barbarism (van Creveld 1992; Huntington 1993) or economization (Collier and Hoeffler 1998, 2004; Jean and Rufin 1999), others suggest that they are driven by more complex mechanisms (Bayart et al. 1999; Kaldor 1997; Reno 1998; Richards 1996). We tend to support the second argument and agree with the notion that research in this area must be based on the findings of field research and case studies. Gerring (2004, page 342) defines a case study as “an intensive study of a single unit for the purpose of understanding a larger class of (similar) units.” We believe that a partial formalization of what is perceived of as contemporary conflicts into a model is possible and, from an epistemological point of view, is essential.

An agent-based modeling approach allows for both the implementation of qualitative data and the formalization of these data. Conservatively speaking, an inductive proceeding avoids the pitfall of prejudice, sheds light on the “veritable” character of the research subject, and highlights the necessity of interdisciplinary research. A deductive proceeding, on the other hand, allows us to test hypotheses and theory building. Furthermore, it assures the accurate embedding of the research subject into a broader context. However, in agent-based modeling, it is more suitable to

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speak in Axelrod's terms (1997, page 24) of "the third way of doing science." We believe that the third way allows us to proceed creatively and exploratively. This may solve some of the material problems of analyzing contemporary conflicts and enhance our understanding of them, both in general and specifically in the case of Iraq.

We first examine the notion of contemporary conflicts. Then we introduce the intuitive WarSocietyModel (iWSM)<sup>1</sup> in an attempt to validate it qualitatively in the case of Iraq.<sup>2</sup> Finally, we implement this into an agent-based architecture for further analysis.

## **CONTEMPORARY CONFLICTS, iWSM, AND THE IRAQ CONFLICT**

### **Contemporary Conflicts**

While van Creveld (1992) has postulated the end of the Clausewitzian wars and Jean and Rufin (1999) have compiled a seminal book on the economies of civil wars, it was Kaldor (1997) who introduced a vague but nevertheless insightful conceptualization of contemporary conflicts. Her notion — developed in a comprehensive case study of the conflict in Bosnia — has gained broad influence. We believe she has caught the main characteristics of the subject.<sup>3</sup>

Kaldor (1997, page 7) defines (contemporary) conflict "as conflict between politically organized groups involving large-scale violence." States do not matter anymore; conversely, their disintegration leads to the diminishing of state borders, interdependence of internal and external actors, and emergence of new nonstate actors. Furthermore, shadow economies develop where property rights cannot be guaranteed anymore — an anomic space evolves. While it would be misleading to underestimate the greed factor in contemporary conflicts (Collier and Hoeffler 2004), one of the main driving forces in a contemporary conflict setting is what Kaldor (1997) refers to as the "politics of identity." By this, she means the manipulation of groups by leading actors with a repertoire of "real" or invented cohesion-generating categories, such as ethnicity, religion, or tribe.

### **The intuitive WarSocietyModel (iWSM)**

Kaldor's (1997) characterization of contemporary conflicts can, we believe, be further formalized into a preliminary and effectively intuitive model. A previously intuitive and subsequently qualitatively validating modeling approach is not only reconcilable with the

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<sup>1</sup> When we mean the intuitive model, we refer to it as iWSM. When we mean the agent-based model, we refer to it as WSM. Both iWSM and WSM are part of Geller's doctoral dissertation.

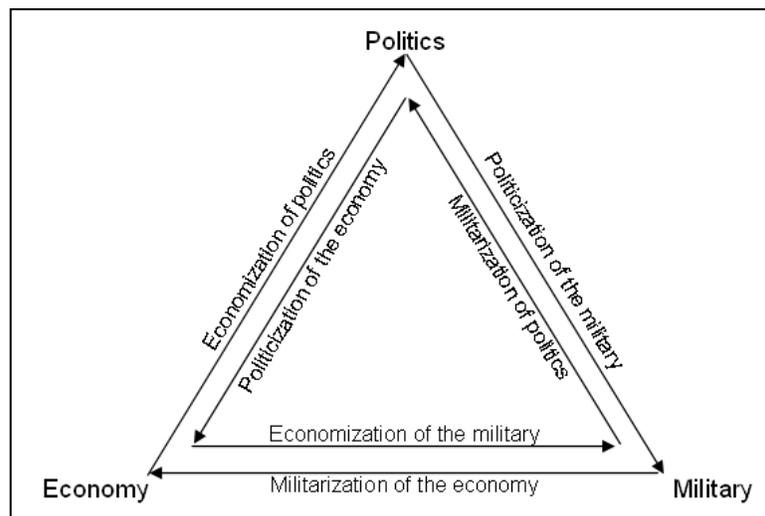
<sup>2</sup> Note that because of a lack of space, we conduct this step only in an exemplified manner.

<sup>3</sup> In her writings, she uses the term "new wars." For many, but especially for historical, reasons (cf. Kalyvas 2001), we reject that and instead apply the term "contemporary conflicts." Besides, we are well aware of the fact that the notion of "new wars" has been criticized upon various aspects we cannot discuss here further. However, we believe that it catches some of the main characteristics of contemporary conflicts. We would like to thank Lars-Erik Cederman for reminding us of this important point.

epistemology of critical realism<sup>4</sup> but also with recent tendencies in agent-based modeling. Outhwaite (1987, page 55) states that “we have intuitions about the structure of almost all the social processes we may care to think about; these may be right or wrong, but they at least give us an *entrée* into the subject matter.” Moss and Edmonds (2005) highlight the importance of relying on qualitative data when designing agent-based models. For the moment, a viable theory of contemporary conflicts is nonexistent. Therefore, we use an intuitive model as a starting point. However, since reliable quantitative data on the subject are scarce (Barakat et al. 2002), we base our intuitive model on qualitative case studies.

Kaldor’s (1997) comments bring forth — in congruence with other case studies (Bayart et al. 1999; Reno 1998; Richards 1996) — the depicted formalization (Figure 1), namely, the iWSM. The iWSM illustrates in a simple way the main constituents of a contemporary conflict setting: *politics*, *economy*, and the *military*.<sup>5</sup>

The political system is based on the mechanisms of neo-patrimonialism (Médard 1990) and redistribution (Reno 1998; Richards 1996). As reported by Weber ([1921] 1980), patrimonialism is based on authority, military power, and suppressed subjects.<sup>6</sup> The suffix “neo” deposes the notion patrimonialism from the Weberian connotation, for it must not be based on traditional grounds. However, it is not only military power that assures authority but also the capability to redistribute social and economic resources. Actors in the political system (i.e., politicians) are therefore resource redistributors who can rely on military authority. Hence, the political system penetrates the economic system and the military system. These two



**FIGURE 1** The intuitive War Society Model (iWSM)

<sup>4</sup> The conceivability of emerging properties is, as it is in agent-based modeling and complexity theory, inherent to critical realism’s ontology.

<sup>5</sup> We emphasize that the way we apply these three terms must not be confounded with their quotidian or general scientific usage.

<sup>6</sup> In our context, the suppressed subjects would be civilians. We do not consider them as being constitutive for the iWSM. Nevertheless, they will be introduced to the WSM.

processes are depicted in our model as the politicization of the economy and the military, respectively.

In the context of Sub-Saharan Africa, Hibou (1999, page 71) speaks of economies of plunder and defines them as “acquisition . . . by the representatives of public authority . . . of economic resources for private purposes.” For contemporary conflicts, where public authority is either humble or has collapsed, it is, in our view, appropriate to speak of a double economy of plunder: “Officials” plunder a territory’s resources in which there are also private economic actors. The idea of the shadow state can be used to link the political system with the economic system via the mechanism of neo-patrimonialism (Reno 2000). Economic actors need to play the game of neo-patrimonialism in order to open their own trade channels as a means either to get access to resources or to sell them. In Figure 1, this is referred to as the economization of politics. The economization of the military is about the self-interest of economic actors in sustaining the economic system in a highly insecure environment in order to ensure economic profit (Hibou 1999; Reno 2000).

Contemporary conflicts, notorious as they are, cannot be reduced to phenomena that erupt in violence as an end in itself. Ellis (1999) and Richards (1996) expose, in two carefully conducted case studies, the role of violence with respect to politics in Sierra Leone and religion in Liberia. The militarization of politics and the economy brings this particular aspect into the foreground. While the former tends toward the representation of political ideas with violent means, the latter identifies rent-seeking behavior.

## **The Iraq Conflict**

However, how may an intuitive model like the iWSM be validated? How may the construct validity be assured? We propose to contrast our intuitive model with a real case — Iraq. This methodological step is a primary validation. A suitable description of the case of Iraq in the categories of our intuitive model could be considered as a successful primary validation. The secondary validation would be to contrast our data with real data, which are notoriously lacking in conflict-torn societies. However, this secondary validation is not conducted in this study.<sup>7</sup>

While the Iraq conflict used to be, in its first phase, a traditional Clausewitzian war, it has changed its nature in its second phase to what we described above as contemporary conflict. Although it appears on the surface to be a war between a resistance force and an occupying army, the current conflict in Iraq is, in our view, strife over political power among various actors. Political actors compete over scarce resources to build their own power bases and try to position themselves in a highly fluid situation. To achieve this aim, economic actors and combatants are being instrumentalized, with each one hoping to profit from the situation.

### *Political System in Iraq*

During Saddam Hussein’s tyranny (1979–2003), the Sunnis were favored over the Shias and Kurds. Following the overthrow of the dictator, the Sunnis, Shias, and Kurds became the

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<sup>7</sup> See, for example, Cederman (2003).

major three actors in Iraq. Their current animosity toward each other is both a legacy of Saddam Hussein's rule and grounded in the traditional tribal and family structures of Iraqi society. Saddam Hussein's tyranny was based on five pillars, mainly taken by Sunnis: the Baath Party, the government, the military, and the security and intelligence services, in addition to the families and tribes. The coalition's invasion destroyed four of these pillars, leaving one intact – the families and tribes.<sup>8</sup> Party and government members, the soldiers, and the myrmidons of the security and intelligence services returned to their families and tribes (Baram 2003; Tilgner 2003). Nothing similar happened in the Shia or Kurdish community. However, the Shia and Kurds also seem fragmented along tribal as well as religious cleavages. This is epitomized in the Shias' case, for example, by the tensions among the Ayatollah Ali Sistani, Ayatollah Mohammed Bakr Hakim (murdered), and the radical and militant cleric, Moqtada Sadr. In the Kurdish case, the rivalries between Massoud Barzani and Jalal Talabani (today's president) may be contemplated.

The anomic situation that resulted in the aftermath of Saddam Hussein's overthrow led to the emergence of new "old" political actors who are reorganizing themselves and are building new power bases. Hereunto they affiliate themselves with economic and military actors — and vice versa.

### *Economic System in Iraq*

From an economic perspective, Iraq is undergoing radical economic privatization. Large-scale fraud and corruption are daily business. As reported by the British newspaper *The Guardian*, 100 Mio. \$ of reconstruction money has disappeared (*The Guardian* 2005). In August 2003, the United Nations published a report in which it named organized crime (such as drug, oil, and copper smuggling, kidnapping, and ransom killing) as one of the most pressing problems in Iraq (UNODC 2003). Approximately 60% of the investment volume in Iraq is flowing into the private security apparatus. Subsequently, what has developed is a shadow economy that is plundering Iraq's resources. Notwithstanding this, it is difficult to investigate who is profiting from this hustle and bustle. A plausible conjecture is that local or regional political actors are financing themselves via these activities and that economic actors are profiting for their own sake.

### *Military System in Iraq*

After the dissolution of the Iraqi army, most soldiers fled back to their ancestral places (Baram 2003; Tilgner 2003). Undisputedly, it is they who form the backbone of the Iraqi resistance — not international terrorist fighters, as has been claimed by some officials and parts of the media (Hottinger 2004). The big picture of the resistance is that Sunni and Shia armed groups are fighting coalition troops and collaborators. But a closer look reveals that they are also fighting each other, the Kurdish armed groups, and, most obviously, the civilian population. None of these entities are monolithic, which is disclosed by the multitude of armed groups currently active in Iraq. Equally heterogeneous are their aims, as some of them are pursuing political intentions, whereas others are after economic profits.

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<sup>8</sup> We would like to thank Albert A. Stahel for this insight.

## WSM: EXPLORING THE IRAQ CONFLICT<sup>9</sup>

In a qualitative perspective, the iWSM is capable of shedding some structuralizing light on the somewhat deteriorating case of Iraq. This superimposition can be considered as a primary validation. The iWSM's ontology also enlightens the complex systems characteristics of contemporary conflicts in general and the Iraq conflict in specific. Two of the most important of them are sensitivity to initial conditions and emerging properties. Complex systems deprive themselves from being analyzed with standard methodological instruments (Moss and Edmonds 2005; Saperstein 1995). For this reason, and complementary to the aforementioned considerations on data availability, we developed an agent-based model, grounded on the iWSM, in order to deepen our understanding of the subject examined.<sup>10</sup> Cederman (2001, page 16) describes agent-based modeling as “a computational methodology which allows the analyst to create, analyze, and experiment with artificial worlds populated by agents that interact in non-trivial ways and that constitute their own environment.”

Emergent properties depend on the rules given to the model's agents, and sensitivity to initial conditions may be tested by controlling the model's parameters. Our simulation model assumes three kinds of proactive agents, vicarious for the three aforementioned systems: *politicians*, *businessmen*, and *warriors*. The fourth sort of agents, *civilians*, are considered as being only re-active. The agents are placed randomly on a simple 50-by-50-cellwide torus grid and thus are rationally bounded (Simon 1955), since each type of agent has a specific vision (i.e., the range it can scan the grid [Moore neighborhood]). Businessmen, warriors, and civilians have default visions; politicians have a dynamic vision, representing also their power. It is assumed that only warriors and civilians can die. Table 1 specifies the agents' rules.

These rules are, of course, closely linked to the intuitive, meanwhile primarily validated, iWSM. Although not implemented as a rule, politicians are affiliates with businessmen and warriors.<sup>11</sup> Hence, in their behavior, they are following what has been described above as the politicization of the economy and the military, respectively. Affiliation with either businessmen or warriors renders politicians more powerful, but politicians are accountable for a larger power increase than warriors. The sensitivity to loss of military power — proxied by loss of warriors — is not implemented directly into the iWSM but is plausible for the WSM (Figure 2) insofar as military losses lead to defeat and, as a consequence, loss of territory.

Businessmen seek politicians, as the economization of politics suggests. However, for modeling reasons, they do not actively seek warriors,<sup>12</sup> yet they do emanate something like a money pheromone in the range of their vision that makes them attractive to warriors. Businessmen avoid competition insofar as they do not want to be close to other businessmen (Hotelling 1929).

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<sup>9</sup> The WSM is implemented in Repast 3.1.

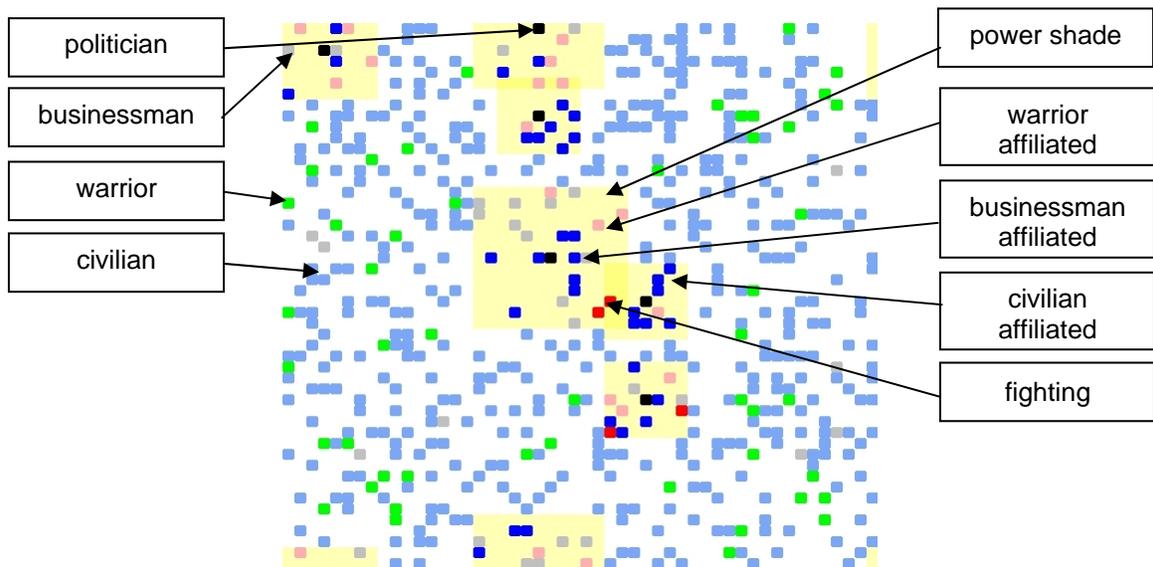
<sup>10</sup> Note that we are not modeling guerrilla warfare.

<sup>11</sup> When affiliated, businessmen and warriors remain spatially bounded in the politician's power shade.

<sup>12</sup> Appropriately, they would seek a leader that we have not modeled.

**TABLE 1** The WSM Agent's Rules

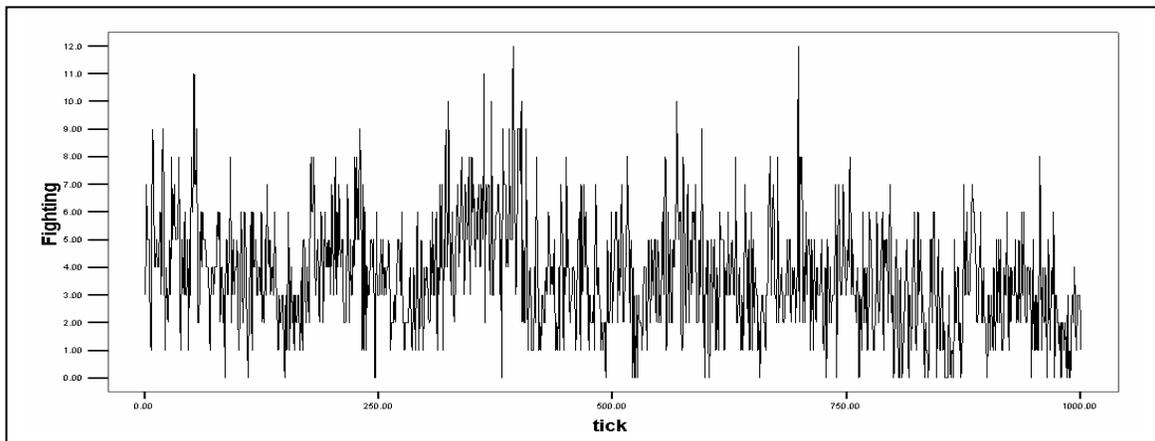
Rule, According to Type of Agent			
Politician	Businessman	Warrior	Civilian
Changes position when losing too many warriors	Seeks politicians	Seeks politicians	Seeks politicians
	Avoids places where other businessmen are	Affiliated with politicians	
		Seeks businessmen	
		Affiliated with other warriors, forming a marauding horde	
		Fights only when affiliated with a businessman or if a member of a horde	
		Does not fight warriors of the same politician or horde nor civilians with identical affiliations	
		Recruits civilians	

**FIGURE 2** WSM snapshot at step 69 (default run; seed 1127491088036)

Warriors seek politicians, and may affiliate with them, as well as with businessmen, in their behavior (in accordance to the militarization of politics and the economy). Warriors obviously fight, but only when they are affiliated with a politician or when they are part of a horde. Fighting when warriors are affiliated with a politician is also vicarious for the militarization of politics and (since politicians attract more businessmen when they have more military power) for the militarization of the economy. Warriors can fight and kill each other as well as civilians. Warriors cannot fight warriors or civilians affiliated with the same politician or warriors who are part of the same horde. They can, however, recruit civilians. Thus, warriors are the only agents who are able to increase their total number. All other agents' numbers either remain stable or decrease.

Last but not least, civilians seek politicians as they are looking for protection. However, they do not provide the politicians with power, since the civilians are not constitutive to the iWSM. Figure 2 shows a typical WSM situation.<sup>13</sup>

Figure 3 gives a statistical impression of the WSM's dynamics measured in the number of times that fighting occurs per time-step. There is no obvious pattern after which the course of fighting develops. However, periods of intensified fighting cluster together, as do periods of relative peace. We have not introduced any kind of mechanism that would allow for reciprocal intensification of fighting. This suggests that the assigned reason for intensified fighting or expanded periods of peace may be found in the constellation of the WSM's agents. We would also like to point out that even after the number of times that fighting occurs starts decreasing (at around 400 ticks), fighting remains highly volatile, and it is still difficult, if not impossible, to predict new outbursts of violence (as, for example, around ticks 600 and 700).



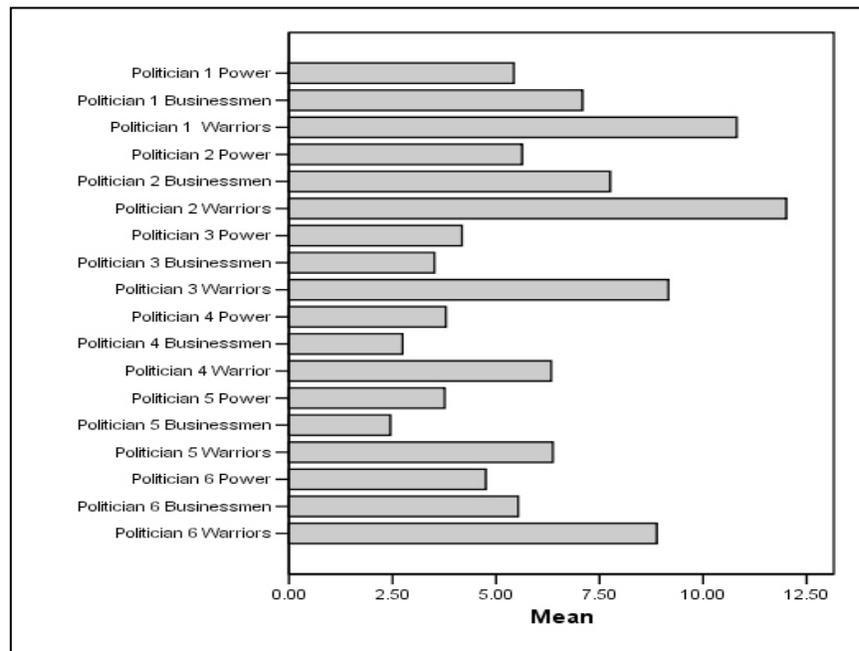
**FIGURE 3** Number of times fighting occurs per time-step for one WSM run (default run; seed 1127332881837)

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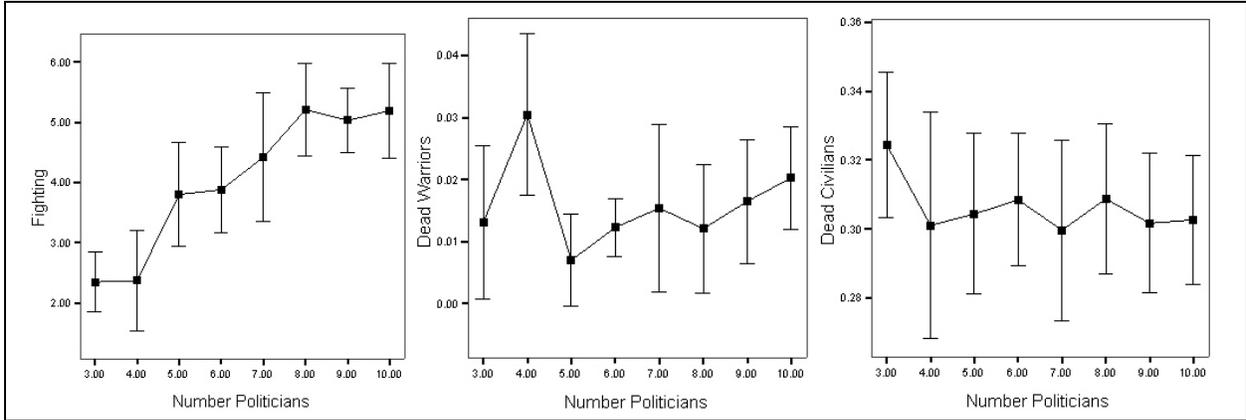
<sup>13</sup> If not otherwise indicated, the default parameters for all the runs are as follows: 6 politicians (vision 3), 30 businessmen (vision 2), 75 warriors (vision 1), and 500 civilians (vision 1). All simulation runs are stopped at step 1,000.

Figure 4 depicts the mean number of affiliated businessmen and warriors of six different politicians and their power, respectively. The two most successful politicians (politician 1 and 2) hold more than 7 businessmen and more than 10 warriors, on average. This could be a first allusion on the single agent level that neither greed nor violence stands for itself. In addition, it could be an indicator for a self-reinforcing process, whereby more powerful politicians become even more powerful in the long run.

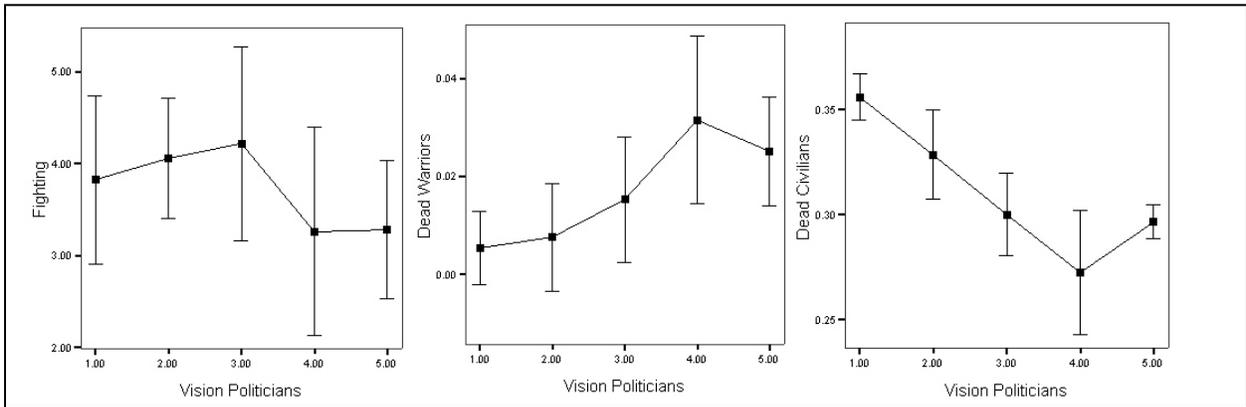
What is the politicians' impact on the WSM? Or, to phrase it differently: Is a more fragmented political landscape more prone to violence than a less fragmented one? We examine this question by incrementing the number of politicians by 1 from 3 to 10. Violence is proxied by the number of times that fighting occurs per time-step, dead warriors, and dead civilians (Figure 5). The solid line indicates the mean out of 10 runs, and the error bars indicate one standard deviation (as they also do for Figures 6–8). We find that with an increasing number of politicians, the average number of times that fighting occurs per time-step increases as well (Figure 5). Bear in mind that warriors may fight only when they are affiliated with a politician or are members of a horde. In the WSM, hordes are rare and temporally constrained phenomena. Affiliation with a politician, however, is “lifelong.” Thus, with an increasing number of politicians, the chance of organized violence increases. The number of dead warriors increases slightly. Bear in mind that warriors contribute to the politician's power. An exceeding number of politicians and exceedingly more powerful politicians make space scarce, resulting in more contact between politicians' power shades, with this, in turn, resulting in more fighting and slightly more dead warriors. Although we expected the number of dead civilians to increase (because of running into more affiliated warriors) or decrease (because of finding more places to hide), it remains fairly stable. This encourages us in our notion that, whatever the situation is, the civilian population suffers the most. However, the wide range of the standard deviation (also



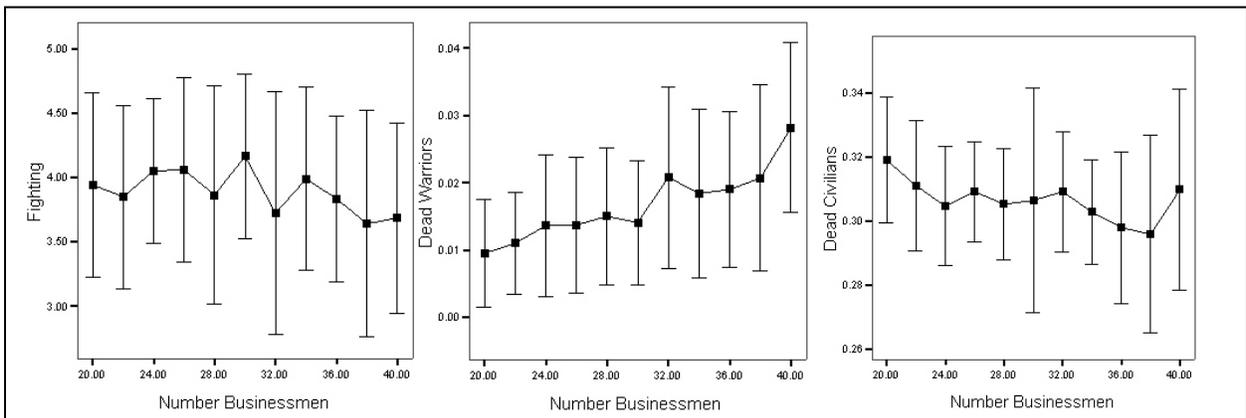
**FIGURE 4** Politicians' power bases broken down to affiliated businessmen and warriors (default run; seed 1127332881837)



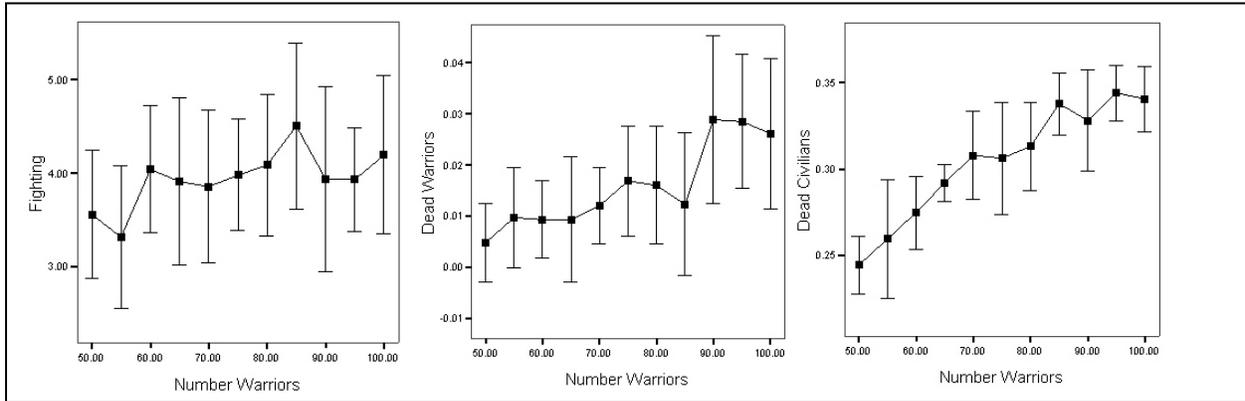
**FIGURE 5** Impact of increasing number of politicians on WSM



**FIGURE 6** Impact of increasing vision of politicians on WSM



**FIGURE 7** Impact of increasing number of businessmen on WSM



**FIGURE 8** Impact of increasing number of warriors on WSM

shown in Figures 6–8) renders a precise interpretation of the results difficult and, at the same time, underlines the highly volatile character of the WSM.

The aforementioned alluded-to results instigated us to analyze whether more powerful politicians entail less violence. Vision, our proxy for power, is incremented by 1 from 1 to 5. More powerful politicians abate fighting but do not abate the number of dead warriors (Figure 6). This could be the result of major combat in the power shade fringe area. In contrast to this, the number of dead civilians is decreasing, suggesting that they are more likely to hide. However, constraints in the WSM were circumvented to simulate larger values for the politicians' visions and thus gain deeper insight into the matter.

Collier and Hoeffler (1998, 2004) report that greed is one of the main incentives for actors in (contemporary) conflict. We scrutinize this finding by incrementing the number of businessmen by 2 from 20 to 40. More businessmen should lead to more violence. Figure 7 shows that violence is decreasing only slightly. However, a wide standard deviation, when compared with an increase in politicians' power, suggests that fighting becomes more volatile and therefore less predictable. An explanation for this may be that more businessmen cause faster power changes of politicians, since their affiliation is not “lifelong” but instead depends on the politicians' power. The increasing number of dead warriors may be explained as follows: an increasing number of businessmen leads to more powerful politicians, which further increases the likelihood of warriors getting affiliated with politicians and therefore being able to fight. In addition, more powerful politicians increase the likelihood of fighting in fringe areas. Thus, the economization of conflict may lead to an increasing militarization. The number of civilian deaths is slightly decreasing. Again, more businessmen lead to more powerful politicians, under whom civilians may hide. Nevertheless, civilians bear the brunt of conflict.

If businessmen do not increase violence significantly on the entire scale, then what about warriors? The number of warriors in Figure 8 is incremented by 5 from 50 to 100. More warriors (compared to those in Figure 7) lead to more fighting, as could be expected. They also lead to more dead warriors. Bear in mind that one warrior is accountable for less of a power increase for a politician than is one businessman. Only a large number of warriors lead to a significant increase of the politicians' power shades and to more fighting among warriors in the fringe areas. If we compare fighting in Figure 8 and Figure 4, we see again that the number of times that

fighting occurs per time-step depends mainly on the number of politicians. Yet an increasing number of warriors entails a significant increase in the number of civilian deaths. As more warriors in the beginning lead to more affiliated warriors, there is also a higher chance for a civilian to have contact with a warrior with the ability to fight. Figures 7 and 8 suggest that neither businessmen nor warriors contribute independently to the development of a contemporary conflict.

## CONCLUSIONS

Encouraged by the paucity of research on the systemic character of contemporary conflicts, we have developed an intuitive model of a contemporary conflict setting: the iWSM. Three interacting systems — politics, economy, and the military — are constituents of the iWSM. Out of this creative process, a first desideratum accrues: How may an intuitive model that later becomes the basis for an agent-based model be validated?

The implementation of the iWSM in an agent-based model (WSM) unearthed some interesting results that may help us better understand contemporary conflicts in general and the Iraq conflict in particular. First, more political leaders entail more violence. In other words, a more fragmented political landscape in a conflict-torn society seems to be more prone to violence than a less fragmented landscape, as could be observed in Iraq after the topple of Saddam Hussein. Second, our findings suggest that an economization of conflict (i.e., an increasing number of businessmen) also leads to a militarization of conflict. Third, an increasing number of warriors results in an increasing number of civilian deaths — a development that was observed after the dissolution of the Iraqi Army. Fourth, neither businessmen nor warriors contribute independently of each other to a contemporary conflict's outcome. Fifth, civilians bear the major burden, as can be seen daily in Iraq. Last but not least, our data suggest that a contemporary conflict's system effects are complex and difficult, if not impossible, to predict. This leads us to a second desideratum: How may social simulation data can be validated against reality in the worst case (i.e., in contemporary conflicts)?

Rather than concluding that (1) the nongovernmental leaders in Iraq should be taken out, (2) the Iraqis should unite under one national leadership, (3) foreign private enterprises should leave the country, and (4) warriors should be disarmed, we would like to emphasize a third desideratum: How may the hermeneutical circle in agent-based modeling be further standardized? We hope our suggested procedure is a first step in the right direction and will help us gain a better understanding of the events in Iraq and perhaps of contemporary conflicts as a whole. For this, further investigation of the iWSM and the WSM, both qualitatively and quantitatively, is needed. From a qualitative perspective, plans are to design the iWSM as an integrated model (integrated intuitive WSM; iiWSM). By this, we mean that real actors should be consulted for developing the agent rules. While Iraq does not seem to be the place for this at the moment, Afghanistan may be. From a quantitative perspective, the WSM's output may be put under further investigation. It would be most interesting to see if some of our data, perhaps the aggregated data, are as power-law-distributed as well as Cederman (2003) or Johnson et al. (2005), for example, suggest. Another equally interesting question would be if our data also exhibit clustered volatility, as Moss and Edmonds (2005) found for their data. To examine our model output in a more dynamic fashion, a repeated measurement analysis of variance could be

conducted. With this, we could perhaps identify typical development paths for different settings of the WSM.<sup>14</sup>

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<sup>14</sup> We would like to thank Wander Jager for this pointer.

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